Curriculum Vitae

Wu Li

June 30, 2004

EDUCATION:

- B.S. in Mathematics, Zhejiang Normal University, Feb. 1978 – Feb. 1982
- M.S. in Mathematics, Hangzhou University, Feb. 1982 – Dec. 1983
- M.S. in Computer Sciences, The Pennsylvania State University, Jan. 1987 – May 1990
- Ph.D. in Mathematics, The Pennsylvania State University, Jan. 1987 – May 1990

EXPERIENCE:

- Assistant Instructor, Department of Mathematics, Hangzhou University, Dec. 1984 – Dec. 1986
- Assistant Professor in Mathematics, Old Dominion University, Aug. 1990 – Aug. 1996
- Visiting Professor, University of Erlangen-Nürnberg, Germany, Jun. – Aug. 1996
- Associate Professor in Mathematics, Old Dominion University, Aug. 1996 – July 2002
- Consultant, ICASE and NASA Langley Research Center, Oct. 2000 – July 2002
- Professor in Mathematics, Old Dominion University, Aug. 2002 – Dec. 2002
- Research Engineer, NASA Langley Research Center, Aug. 2002 – Mar. 2004
- Senior Research Engineer, NASA Langley Research Center, Apr. 2004 – Present

RESEARCH INTERESTS:

- My main research interests include numerical algorithms for solving quadratic and nonlinear programming, convergence analysis of optimization algorithms, stability analysis of optimal solutions with respect to data perturbations, robust optimization under data uncertainty, reverse engineering, data smoothing, and approximation theory. I have published one monograph on approximation theory in 1991 and over 60 refereed papers in professional journals (including AIAA Journal, Journal of Aircraft, SIAM Journal on Optimization, SIAM Journal on Control and Optimization, SIAM Journal on Scientific Computing, SIAM Journal on Mathematical Analysis, Mathematical Programming, Mathematics of Operations Research, Transactions of American Mathematical Society, Journal of Optimization Theory and Applications, Journal of Mathematical Analysis and Applications, etc.). My recent research interests include risk analysis in early-phase design of complex systems and design-oriented optimization methods for engineering applications.

PUBLICATIONS:

Monograph:

- W. Li, *CONTINUOUS SELECTIONS FOR METRIC PROJECTIONS AND INTERPOLATING SUBSPACES*, Approximation and Optimization, Vol. 1, Verlag Peter Lang, Frankfurt a.M. & Bern, 1991. (MR 93a:41067)

Refereed Journal Papers (SCI index was recorded in Nov. 2003):

1. W. Li and S. Krist, Spline-based airfoil curvature smoothing and its applications, submitted for publication in Journal of Aircraft (under revision), April 2004.

2. W. Li and S. Padula, Using high resolution design spaces for aerodynamic shape optimization under uncertainty, NASA/TP-2004-213004, 2004.

3. W. Li and J. de Nijs, An implementation of QSPLINE method for solving convex quadratic programming problems with simple bound constraints, Journal of Mathematical Sciences, 116 (2003), 3387–3410.

4. L. Huyse, M. Lewis, S. Padula, and W. Li, Probabilistic approach to free-form airfoil shape optimization under uncertainty, AIAA Journal, 40 (2002), 1764–1772.

5. W. Li, L. Huyse, and S. Padula, Robust airfoil optimization to achieve consistent drag reduction over a range of Mach numbers, Structural and Multidisciplinary Optimization, 24 (2002), 38–50.

6. J. Huband and W. Li, Reverse engineering of RAPID prototyping tool for aircraft wing design, Mathematical Engineering in Industry, 8 (2001), 239–252.

7. W. Li and I. Singer, Asymptotic constraint qualifications and error bound for semi-infinite systems of convex inequalities, in "Semi-Infinite Programming: Recent Advances", eds. Miguel A. Goberna and Marco A. López, Kluwer Academic Publishers, Dordrecht, 2001, pp. 75–100.

8. W. Li, C. Nahak, and I. Singer, Constraint qualifications for semi-infinite systems of convex inequalities and applications, SIAM J. Optim., 11 (2000), 31–52. (**SCI: 2**)

9. M. Bartelt and W. Li, Exact order of Hoffman's error bounds for elliptic quadratic inequalities derived from vector-valued Chebyshev approximation, Math. Programming, Ser. B, 88 (2000), 223–253.

10. M. Finzel and W. Li, Piecewise affine selections for piecewise polyhedral multifunctions and metric projections, J. Convex Anal., 7 (2000), 73–94.

11. F. Deutsch, W. Li, and J. Ward, Best approximation from the intersection of a closed convex subset and a polyhedron in Hilbert space, weak Slater conditions, and the strong conical hull intersection property, SIAM J. Optim., 10 (2000), 252–268. (**SCI: 3**)

12. H. Bauschke, J. Borwein, and W. Li, On the strong conical hull intersection property, bounded linear regularity, Jameson's property (G), and error bounds in convex optimization, Mathematical Programming, 86 (1999), 135–160. (**SCI: 7**)

13. F. Deutsch, W. Li, and J. Swetits, Fenchel duality and the strong conical hull intersection property, J. Optim. Theory Appl., 102 (1999), 681–695. (**SCI: 5**)

14. J. Huband and W. Li, An explicit representation of Bloor-Wilson PDE surface model by using canonical basis for Hermite interpolation, Mathematical Engineering in Industry, 7 (1999), 421–431.

15. M. Bartelt and W. Li, Abadie's constraint qualification, Hoffman's error bounds, and Hausdorff strong unicity, Journal of Approximation Theory, 97 (1999), 140–157. (**SCI: 1**)

16. D. Klatte and W. Li, Asymptotic constraint qualifications and global error bounds for convex inequalities, Mathematical Programming, 84 (1999), 137–160. (**SCI: 8**)

17. W. Li and J. Swetits, Regularized Newton methods for minimization of convex quadratic splines with singular Hessians, in "Reformulation: Nonsmooth, Piecewise Smooth, Semismooth and Smoothing Methods", edited by M. Fukushima and L. Qi, Kluker Academic Publishers, MA, 1999, pp. 235–257.

18. M. Finzel and W. Li, Uniform Lipschitz continuity of best ℓ_p-Approximations by polyhedral sets, Journal of Mathematical Analysis and Applications, 228 (1998), 112–118. (**SCI: 1**)

19. D. Marpe, H. L. Cycon, and W. Li, A complexity constraint best-basis wavelet packet algorithm for image compression, IEE Proceedings: Vision, Image and Signal Processing, 145 (1998), 391–398.

20. W. Li and J. Swetits, Linear ℓ_1 estimator and Huber M-estimator, SIAM Journal on Optimization, 8 (1998), 457–475. (**SCI: 11**)

21. W. Li and I. Singer, Global error bounds for convex multifunctions and applications, Mathematics of Operations Research, 23 (1998), 443–462. (**SCI: 8**)

22. M. Bartelt and W. Li, Characterization of generalized Haar spaces, Journal of Approximation Theory, 92 (1998), 101–115.

23. W. Li, Abadie's constraint qualification, metric regularity, and error bounds for differentiable convex inequalities, SIAM Journal on Optimization, 7 (1997), 966–978. (**SCI: 10**)

24. W. Li and J. Swetits, A new algorithm for strictly convex quadratic programs, SIAM Journal on Optimization, 7 (1997), 595–619. (**SCI: 9**)

25. W. Li, Unconstrained minimization of quadratic splines and applications, in "Multivariate Approximation and Splines", G. Nürnberger, J. W. Schmidt, and G. Walz (eds.), Birkhäuser, Basel, 1997, pp. 113–128.

26. H. Berens, M. Finzel, W. Li, and Y. Xu, Hoffman's error bounds and uniform Lipschitz continuity of best ℓ_p-approximations, Journal of Mathematical Analysis and Applications, 213 (1997), 183–201. (**SCI: 1**)

27. F. Deutsch, W. Li, and J. Ward, A dual approach to constrained interpolation from a convex subset of Hilbert space, J. Approx. Theory, 90 (1997), 385–414. (**SCI: 7**)

28. R. Huotari and W. Li, Continuity of metric projection and geometric consequences, Journal of Approximation Theory, 90 (1997), 319–339. (**SCI: 3**)

29. W. Li, A merit function and a Newton-type method for symmetric linear complementarity problems, in "Complementarity and Variational Problems", Proceedings of International Conference on Complementarity Problems, held at the Johns Hopkins University, November 1–4, 1995, edited by M. Ferris and J.-S. Pang, SIAM, Philadelphia, 1997, pp. 181–203.

30. H. Kaneko, P. Z. Daffer, and W. Li, On the Reich's conjecture, Proceedings of American Mathematical Society, 124 (1996), 3159–3162.

31. W. Li, Differentiable piecewise quadratic exact penalty functions for quadratic programs with simple bound constraints, SIAM Journal on Optimization, 6 (1996), 299–315. (**SCI: 3**)

32. W. Li, A conjugate gradient method for unconstrained minimization of strictly convex quadratic splines, Mathematical Programming, 72 (1996), 17–32. (**SCI: 4**)

33. W. Li, D. Naik, and J. Swetits, A data smoothing technique for piecewise convex/concave curves, SIAM Journal on Scientific Computing, Vol. 17 (1996), 517–537. (**SCI: 4**)

34. W. Li, Error bounds for piecewise quadratic programs and applications, SIAM Journal on Control and Optimization, 33 (1995), 1510–1529. (**SCI: 16**)

35. W. Li, Linearly convergent descent methods for unconstrained minimization of convex quadratic splines, Journal of Optimization Theory and Applications, 86 (1995), 145–172. (**SCI: 8**)

36. W. Li, Convergence of Pólya algorithm and continuous metric selections in space of continuous functions, Journal of Approximation Theory, Vol. 80 (1995), 164–179.

37. M. Bartelt and W. Li, Error estimates and Lipschitz constants for best approximation in continuous function spaces, Computers and Mathematics with Applications, Vol. 30 (1995), 255–268.

38. R. Huotari and W. Li, The continuity of metric projection in $\ell_\infty(n)$, the Pólya algorithm, the strict best approximation, and tubularity of convex sets, Journal of Mathematical Analysis and Applications, Vol. 182 (1994), 836–856. (**SCI: 4**) (MR 95b:41041)

39. W. Li, Sharp Lipschitz constants for basic optimal solutions of linear programs, SIAM Journal on Control and Optimization, Vol. 32 (1994), 140–153. (**SCI: 5**) (MR 94m:90110)

40. F. Deutsch, W. Li, and M. Mabizela, Hahn-Banach extensions, Tietze extensions, Lipschitz extensions, and best approximation, in "Parametric Optimization and Related Topics III", H.Th. Jongen, B. Kummer, and F. Nozicka, eds., Approximation & Optimization, Vol.3, Verlag Peter Lang, 1993, pp. 107–120. (MR 95c:41058)

41. W. Li, Error bounds for solutions of parametric convex-concave minimaxproblems, in "Parametric Optimization and Related Topics III", H.Th. Jongen, B. Kummer, and F. Nozicka, eds., Approximation & Optimization, Vol.3, Verlag Peter Lang, 1993, pp. 373–394. (MR 94i:49045)

42. W. Li and J. Swetits, A Newton method for convex regression, data smoothing, and quadratic programming with bounded constraints, SIAM Journal on Optimization, Vol. 3 (1993), 466–488. (MR 94i:90086)

43. W. Li, A. J. Hoffman's theorem and metric projections in polyhedral spaces, Journal of Approximation Theory, Vol. 75 (1993), 107–111. (**SCI: 8**) (MR 94i: 90134)

44. W. Li, The sharp Lipschitz constants for feasible and optimal solutions of a perturbed linear program, Linear Algebra and Applications, Vol. 187 (1993), 15–40. (MR 94i:90135)

45. W. Li, Remarks on convergence of matrix splitting algorithm for the symmetric linear complementarity problem, SIAM Journal on Optimization, Vol. 3 (1993), 155–163. (MR 93j:90118)

46. W. Li, P. Pardalos, and C. Han, Gauss-Seidel method for least distance problems, Journal of Optimization Theory and Applications, Vol. 75 (1992), 487–500. (**SCI: 12**) (MR 93j:90074)

47. W. Li, Best approximations in polyhedral spaces and linear programs, in "Approximation Theory", G. Anastassiou ed., Lecture Notes in Pure and Applied Mathematics, Vol. 138, Marcel Dekker, Inc., New York, 1992, pp. 393–400.

48. F. Deutsch and W. Li, Strong uniqueness, Lipschitz continuity, and continuous selections of metric projections in $L_1(T, \mu)$, Journal of Approximation Theory, Vol. 66 (1991), 198–224. (**SCI: 3**) (MR 92h:41054)

49. F. Deutsch, W. Li, and S. Park, Tietze extensions and continuous metric selections, Journal of Approximation Theory, Vol. 64 (1991), 55–68. (MR 92b:54037)

50. W. Li, Various continuities of metric projections in $L_1(T, \mu)$, in "Progress in Approximation Theory", P. Nevai and A. Pinkus eds., Academic Press, Inc., Boston-New York, 1991, pp. 583–607. (MR 93a:41066)

51. W. Li, Weak Chebyshev Subspaces and A-subspaces of $C[a, b]$, Transactions of American Mathematical Society, Vol. 322 (1990), 583–591. (MR 91c:41073)

52. W. Li, Lipschitz continuous metric selections in $C_0(T)$, SIAM Journal on Mathematical Analysis, Vol. 21 (1990), 205–220. (**SCI: 4**) (MR 90k:41040)

53. F. Deutsch, W. Li, and S. Park, Characterizations of continuous and Lipschitz continuous selections for metric projections in normed linear spaces, Journal of Approximation Theory, Vol. 58 (1989), 297–314. (**SCI: 12**) (MR 90h: 41028)

54. W. Li, Continuous metric selection and multivariate approximation, Journal of Mathematical Analysis and Applications, Vol. 143 (1989), 187–197. (**SCI: 2**) (MR 90j:41063)

55. W. Li, Various continuities of metric projections in $C_0(T, X)$, Journal of Approximation Theory, Vol. 57 (1989), 150–168. (**SCI: 4**) (MR 90g:41038b)

56. W. Li, The intrinsic characterization of lower semicontinuity of the metric projection in $C_0(T, X)$, Journal of Approximation Theory, Vol. 57 (1989), 136–149. (**SCI: 3**) (MR 90g:41038a)

57. W. Li, Strong uniqueness and Lipschitz continuity of metric projections: A generalization of the classical Haar theory, Journal of Approximation Theory, Vol. 56 (1989), 164–184. (MR 90e:41013)

58. W. Li, Problems about continuous selections in $C(X)$ (IV): Characteristic description, Acta Mathematica Sinica (in Chinese), Vol. 31 (1988), 299–308. (MR 90d:41056b)

59. W. Li, Problems about continuous selections in $C(X)$ (III): Local alternation elements, Acta Mathematica Sinica (in Chinese), Vol. 31 (1988), 289–298. (MR 90d:41056a)

60. W. Li, Problems about continuous selections in $C(X)$ (II): Alternation signatures, Acta Mathematica Sinica (in Chinese), Vol. 31 (1988), 11–20. (MR 89m:41025)

61. W. Li, Problems about continuous selections in $C(X)$ (I): Quasi-Haar subspaces, Acta Mathematica Sinica (in Chinese), Vol. 31 (1988), 1–10. (MR 89m:41024)

62. W. Li, Characterization of continuous selections and its application in multivariate approximation, Approximation Theory and Its Applications, Vol. 4 (1988), 13–17. (MR 89m:41020)

63. W. Li, The characterization of continuous selections for metric projections in $C(X)$, Scientia Sinica (Ser. A), 31 (1988), 1039–1052. (MR 90f:41043)

64. M. Wang, X. Zhou, and W. Li, Approximation of bounded functions with discontinuity of the first kind by Bernstein polynomials, Journal of Hangzhou University (Science Edition) (in Chinese), Vol. 14 (1987), 265–271. (MR 88i:41013)

65. W. Li, The Rivlin problem in L_1, Journal of Hangzhou University (Science Edition) (in Chinese), Vol. 14 (1987), 5–8. (MR 88f:41046)

66. W. Li, Weak Chebyshev subspaces on locally ordered topology space and the related continuous metric selections, Chinese Annals of Mathematics (Ser. B), Vol. 8 (1987), 420–427. Chinese Annals of Mathematics (Ser. A) (in Chinese), Vol. 8 (1987), 643–644. (MR 89a:41036)

67. W. Li, The degree of approximation with linear constraints, Chinese Annals of Mathematics (Ser. A) (in Chinese), Vol. 7 (1986), 437–443. Chinese Annals of Mathematics (Ser. B), Vol. 7 (1986), 524–525. (MR 88d:41028)

68. W. Li, Timan-type theorems about approximation by algebraic polynomials, Acta Mathematica Sinica (in Chinese), Vol. 29 (1986), 544–549. (MR 88e:41022)

69. W. Li, Derivatives of algebraic polynomial and distribution of its zeros, Journal of Hangzhou University (Science Edition) (in Chinese), Vol. 12 (1985), 183–189. (MR 87a:41017)

Published Abstracts, Technical Reports, and Unrefereed Conference Proceeding Papers:

1. W. Li and S. Padula, Approximation methods for conceptual design of complex systems, in "Proceeding of Eleventh International Conference on Approximation Theory," Gatlinburg, Tennessee, May 18–24, 2004i, C. Chui, M. Neamtu, and L. Schumaker (eds.), Nashboro Press, Brentwood, TN.

2. W. Li, S. Krist, and R. Campbell, Transonic airfoil shape optimization in preliminary design environment, in "10th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference," Albany, New York, 30 Aug – 1 Sep 2004. AIAA Paper 2004-4629, August 2004.

3. W. Li, Profile optimization method for robust airfoil shape optimization in viscous flow, NASA/TM-2003-212408.

4. W. Li and S. Padula, Performance trades study for robust airfoil shape optimization, AIAA Paper 2003-3790. in "The 21st AIAA Applied Aerodynamics Conference," Orlando, June 2003. W. Li and S. Padula, Robust airfoil optimization in high-resolution design space, FIFTH WORLD CONGRESS ON STRUCTURAL AND MULTIDISCIPLINARY OPTIMIZATION, Venice, Italy, May, 2003.

5. S. Padula and W. Li, Options for robust airfoil optimization under uncertainty, 9^{th} AIAA/ISSMO Multidisciplinary Analysis and Optimization Symposium, September 4–6, 2002, Atlanta, GA.

6. W. Li, L. Huyse, and S. Padula, Robust airfoil optimization to achieve consistent drag reduction over a Mach range, NASA/CR-2001-211042, August 2001.

7. D. Marpe, H. L. Cycon, and W. Li, Energy constraint scarce wavelet packet libraries for image compression, January of 1997, Technical Report of Telekom Fachhochschule, 12103 Berlin, Germany.

8. H. L. Cycon, S. A. Zahorian, and W. Li, Stop consonant classification using wavelet packet transforms and a neural network, in "Intelligent Engineering Systems Through Artificial Neural Networks", Vol. 5, Fuzzy Logic and Evolutionary Programming, ANNIE 95, ASME Press, New York, NY, 1995, pp. 733–738.

9. W. Li, Numerical algorithms for the Huber M-estimator problem, in "Approximation Theory VIII–Vol. 1: Approximation and Interpolation", C. K. Chui and L. L. Schumaker, eds., World Scientific Publishing Co., Inc., New York, 1995, pp. 325–334.

10. M. Bartelt and W. Li, Haar theory in vector-valued continuous function spaces, in "Approximation Theory VIII–Vol. 1: Approximation and Interpolation", C. K. Chui and L. L. Schumaker, eds., World Scientific Publishing Co., Inc., New York, 1995, pp. 39–46.

11. W. Li, Strict best approximations, best L_p-approximations and continuous metric selections, in "Approximation Theory VI", C. K. Chui, L. L. Schumaker, and J. D. Ward, eds., Academic Press, New York, 1990, pp. 395–398.

12. W. Li, Continuous selections in $C(X)$, Advances in Mathematics (China), Vol. 15 (1986), 218–219.

Research Papers Presented at Professional Meetings (* indicates invited talks):

1.* "Approximation methods for conceptual design of complex systems," one-hour plenary talk at the 11th International Conference on Approximation Theory, Gatlinburg, Tennessee, May 18 - 22, 2004. (Co-author: S. Padula)

2. "Global Line Search Method for Solving Nonconvex Quadratic Programming Problems With Simple Bound Constraints," a 30-minute invited talk at The 5^{th} International Conference on Optimization: Techniques and Applications, Dec. 15-17, 2001, Hong Kong.

3. "Robust airfoil optimization to achieve consistent drag reduction over a Mach range", a 30-minute contributed talk at the International Workshop on Nonlinear Optimization and Control, Erice, Italy, July 2001. (Co-authors: S. Padula and L. Huyse)

4. "Solving Singular and Degenerate Convex Quadratic Programming Problems with Simple Bound Constraints," a 20-minute contributed talk at the First SIAM Conference on Computational Science and Engineering, Sep. 2000, Washington, D.C. (given by the co-author: Han de Nijs, Old Dominion University)

5. "A Mixed Primal-Dual Approah for Identifying Active Constraints," a contributed talk at the 17th International Symposium on Mathematical Programming, Aug. 2000, Atlanta, Georgia. (co-author: Han de Nijs)

6.* "Global Error Bounds and Constrained Error Bounds," an invited talk at the 17th International Symposium on Mathematical Programming, Aug. 2000, Atlanta, Georgia.

7.* "Exact Order of Hoffman's Error Bounds for Convex Quadratic Inequalities Derived From Vector-Valued Chebyshev Approximation Functions for Variational Inequalities", One Hour Invited Lecture in "Workshop on Error Bounds and Applications in Mathematical Programming", Dec. 8–13, 1998, City University of Hong-Kong, Hong-Kong. (co-author Martin Bartelt)

8.* "On Constraint Qualifications, Linear Representations, Distance Formulas and Error Bounds for Semi-Infinite Systems of Convex Inequalities", the co-author of One Hour Invited Lecture in "Workshop on Error Bounds and Applications in Mathematical Programming", Dec. 8–13, 1998, City University of Hong-Kong, Hong-Kong. (co-author of an invited talk given by Ivan Singer)

9.* "Properties of Penalty Functions Derived From Regularized Gap Functions for Variational Inequalities", 25 minutes invited talk in "Nonlinear Programming and Variational Inequalities", Dec. 15–18, 1998, City University of Hong-Kong, Hong-Kong. (co-author C. Nahak)

10.* "Linear regularity, Jameson's property (G), and error bounds," a 30 minute invited talk at The October INFORMS Conference, held at Dallas, October, 1997. (Co-authors: H. Bauschke and J. Borwein)

11.* "Regularized Newton methods for minimization of convex quadratic splines," a 30 minute invited talk at The 16th International Symposium on Mathematical Programming, held at Lausanne, Switzerland, August 24-29, 1997. (Co-author: J. Swetits)

12.* "Minimization of Quadratic Splines and Applications," a 30 minute invited talk at The 16th International Symposium on Mathematical Programming, held at Lausanne, Switzerland, August 24-29, 1997.

13.* "Exact penalty functions for constrained minimization problems and regularized gap function for variational inequalities," a 30 minute invited talk at The 16th International Symposium on Mathematical Programming, held at Lausanne, Switzerland, August 24-29, 1997. (Co-author: J. Peng)

14.* "Dykstra's algorithm and Fenchel duality for convex minimization in Hilbert space," a co-author of a 30 minute invited talk given by J. Swetits at The May INFORMS Conference, held at San Diego, May, 1997.

15.* "Lipschitz stability of least norm solutions of linear programming problems," the co-author of a 30 minute invited talk given by M. Finzel at The May INFORMS Conference, held at San Diego, May, 1997.

16.* "Unconstrained Minimization of Convex Quadratic Splines and Applications," 30 minute invited talk at *International Conference on Multivariate Approximation and Splines* held at University of Mannheim, Germany, September 8, 1996.

17.* "Least Norm Solutions of Linear Programs and Applications," 30 minute invited talk at *Second Scandinavian Workshop on Linear Programming and Applications* held at Technical University of Denmark, Denmark, August 22, 1996.

18. "Reverse engineering of a rapid prototyping model for aircraft design," a 20 minute talk at a focus session in Fourth SIAM Conference on Geometric Design, held at Vanderbilt University, November, 1995. (Co-authors: Jacalyn Huband and Robert Smith)

19.* "Merit function and gradient-Newton method for symmetric linear complementarity problems," a 20 minute invited talk at the International Conference on Complementarity Problems, held at the Johns Hopkins University, November, 1995.

20. "Haar theory in $C(T, \mathbf{R}^n)$," co-author of a 20 minute talk given by M. Bartelt at Eighth International Conference on Approximation Theory, held at College Station, January, 1995.

21. "Minimization of quadratic splines," 20 minute talk at Eighth International Conference on Approximation Theory, held at College Station, January, 1995.

22. "Differentiable exact penalty functions via Hestenes-Powell-Rockafellar's augmented Lagrangian function," 30 minute contributed talk at the 15th International Symposium on Mathematical Programming, held at Ann Arbor, Michigan, Aug. 15-19, 1994.

23.* "Surface reconstruction by constrained approximation," 30 minute invited talk at the 15th International Symposium on Mathematical Programming, held at Ann Arbor, Michigan, Aug. 15-19, 1994.

24.* "A data smoothing technique for piecewise convex/concave curves," 30 minute invited talk at the 15th International Symposium on Mathematical Programming, held at Ann Arbor, Michigan, Aug. 15-19, 1994. (Co-authors: D. Naik and J. Swetits)

25.* "Error bounds for piecewise convex quadratic programs and convergence analysis of iterative methods for quadratic programs" 20 minute invited talk at The April ORSA/TIMA Conference, held at Boston, April, 1994.

26. "Convex quadratic programs and convex quadratic splines," co-author of a 20 minute invited talk given by J. Swetits on The November ORSA/TIMA Conference, held at Phoenix, November, 1993.

27. "A nonlinear conjugate gradient method for unconstrained minimization of a convex quadratic spline," 20 minute presentation at The November ORSA/TIMA Conference, held at Phoenix, November,1993.

28. "A new algorithm for strictly convex quadratic programs and nonparametric data smoothing," co-authored by J. Swetits, at The 1993 Annual SIAM Meeting, held at Wyndham Franklin Plaza Hotel, Philadelphia, July 12-16, 1993.

29.* "A new algorithm for strictly convex quadratic programs," co-author of the invited talk given by J. Swetits at The Annual ORSA/TIMA Conference, held at Chicago Hilton and Towers, Chicago, May 17-19, 1993.

30. "The Newton method for strictly convex quadratic programs and data smoothing models," 20 minute talk at The Fourth SIAM Conference on Optimization, held at Haytt Regency Hotel, Chicago, May 11-13, 1992.

31. "Nonlinear ℓ_p-approximation in $\mathbf{R}^n$, for $1 \leq p \leq \infty$," 20 minute talk at Seventh Texas International Symposium on Approximation Theory, held at Haytt Regency Hotel, Austin, January 3-7, 1992.

32. "Stability analysis of the least distance problem," 30 minute talk at Thirteenth Symposium on Mathematical Programming with Data Perturbations, held at The George Washington University, May 1991.

33. "Best approximations in polyhedral spaces and linear programs," 20 minute talk at Sixth Southeastern International Conference on Approximation Theory, held at Memphis State University, March 1991.

34. "Strict best approximations, best L_p-approximations and continuous metric selections," 15 minute talk at Sixth International Conference on Approximation Theory, held at Texas A&M University, Jan. 1989.

Presentations Given at Universities:

1. "Algorithms for quadratic programs and data smoothing," an invited colloquium talk at Department of Mathematics and Statistics, University of Maryland at Baltimore County, on September 18, 1992.

2. "The Polar of Convex Sets," one-hour seminar talk at Mathematical Institute of University of Erlangen-Nürnberg, Germany, July 15, 1996.

3. "Error Bounds and Angles Between Convex Sets," one-hour Guest Lecture at Mathematical Institute of University of Erlangen-Nürnberg, Germany, July 24, 1996.

4. "Stability Problems in Optimal Truss Topology Design," one-hour Colloquium at Institute for Applied Mathematics of University of Erlangen-Nürnberg, Germany, September 2, 1996.

5. "Estimate of Distance From a Point to Intersection of Convex Sets," one-hour Guest Lecture at Institute for Operations Research of University of Zürich, Switzerland, September 5, 1996.

6. "Teaching Mathematics on Internet," one-hour Seminar at Department of Mathematics and Statistics, Old Dominion University, January 30, 1998.

7. "Nonlinear Optimization and Applications," Richard F. Barry Mathematics & Statistics Colloquium, Old Dominion University, October 13, 2000.

8. "Robust Optimization Models With PDE Constraints for Airfoil Design," Richard F. Barry Mathematics & Statistics Colloquium, Old Dominion University, December 7, 2001.

9. "Robust Optimization Models for Airfoil Design," an invited colloquium talk at Department of Computing and Software, McMaster University, Canada, January 25, 2002.

GRANTS AWARDED:

1. S. N. Tiwari (the principal investigator), *W. Li* (a co-investigator), and J. Swetits (a co-investigator), "Surface Modeling and Optimization Studies of Aerodynamic Configurations," NCC1-68 Supplement-15, funded by NASA/Langley Research Center, $60,790 from January 1994 to December 1994.

2. S. N. Tiwari (the principal investigator), *W. Li* (a coinvestigator), and J. Swetits (a coinvestigator), "Surface Modeling, Reverse Engineering, and Optimization Studies of Aerodynamic Configurations," NCC1-68 Supplement-16, funded by NASA/Langley Research Center, $35,000 from January 1995 to September 1995.

3. W. Li (the principal investigator), "Nonparametric Data Regression and Surface Reconstruction by Wavelets," 94-NM-390, funded by Air Force Office of Scientific Research, $34,294 from November 1994 to November 1995.

4. W. Li (the principal investigator), "Numerical Optimization and Wavelets for Speech Recognition," DM 6800 from June 1996 to August 1996, funded by German Academic Exchange Service (DAAD).

5. W. Li (the principal investigator), "Minimization of Piecewise Quadratic Functions and Applications", NSF-DMS-9973218, funded by National Sciences Foundation, $71,803 from July 1999 to June 2002.

CONSULTING ACTIVITIES:

From October of 2000 to July of 2002, I worked as a consultant for ICASE on a robust optimization research project funded by NASA Langley Research Center.

AWARDS AND PRIZES:

1. SUPERIOR ACHIEVEMENT AWARD for outstanding development, demonstration, and multidisciplinary risk reduction of the high-speed wing concept, NASA Langley Research Center, 2004.

2. TIME-OFF AWARD for outstanding contribution to multipoint wing design, NASA Langley Research Center, 2003.

3. THE HOMEYER GRADUATE FELLOWSHIP ($1,500), The Pennsylvania State University, 1988.

4. THE GRADUATE SCHOOL FELLOWSHIP ($8,000), The Pennsylvania State University, 1988.

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

- American Mathematical Society (1988-1990)
- Operations Research Society of America (1993-1994)
- Society of Industrial and Applied Mathematics (1992-2002)
- American Institute of Aeronautics and Astronautics (2002-Present)

PROFESSIONAL SERVICE:

Conference Session Organizer:

- the organizer of a session on "Convex quadratic programs and applications" for The November ORSA/TIMA Conference, held at Phoenix, November, 1993.

Reviewer of Mathematical Reviews:

I am a reviewer of Mathematical Reviews. Here is a list of articles I have reviewed for Mathematical Reviews.

1. J. Kyparisis, Sensitivity analysis for variational inequalities and nonlinear complementarity problems, Ann. Oper. Res. 27 (1990), 143-173.

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